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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,537	09/14/2005	**Hans Vondracek**	103020.59950US	4431

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EXAMINER	
YANG, JIE	

ART UNIT	PAPER NUMBER
1793	

MAIL DATE	DELIVERY MODE
09/25/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/551,537	VONDRACEK ET AL.	
	Examiner	Art Unit	
	JIE YANG	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 July 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7,9-18,21,24-28 and 30-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,9-13,15-18,21,24-28 and 30-44* is/are rejected.

7)☒ Claim(s) *14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/28/2009 has been entered.

Status of the Claims

Regarding the Applicant's argument related to the restriction/election, the argument is persuasive and claims 26-44 rejoin in the examination.

Claims 8, 19, 20, 22, 23, and 29 have been cancelled; claims 1-6, 10, 17, 18, 24, 25, 26, 28, 31-34, 36, 37, and 41 have been amended; and claims 1-7, 9-18, 21, 24-28, and 30-44 are pending in application.

Claim Objections

Claim 10 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. For instant case, claim 10 depends on a cancelled claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-7, 9-13, 15-18, 21, 24-28, and 30-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bilgen et al (DE 19839383 used hereinafter with English equivalent US 6,458226, thereafter US'226) in view of Hathaway (US 2,261,878, thereafter US'878) and Fritz et al (NPL "Fertibungs Technik" (Manufacturing Technology) 1995, and English translation for Fig.5-24 and 5-26, thereafter NPL-1).

Regarding claims 1, 25, and 26, US'226 teaches a process for the thermomechanical treatment of steel for torsionally strained spring elements, comprising the inductive heating of a starting material, particularly spring steel, at a rate between 80-150K/s to a temperature between 900°C to 1200°C (e.g. a temperature above the recrystallization temperature of the initial material), austenitizing, holding the temperature for a short time, forming the material into a formed product at a temperature above the recrystallization temperature, quenching to martensite and tempering (Abstract, Summary of the invention, Col.3, lines 31-59, and claims of US'226), which read on the

heating above recrystallization temperature, equalizing the heating, deforming, hardening, and tempering steps of the instant claims. US'226 teaches the material is formed in at least one forming step (abstract of US'226), which covers the single forming step as recited in the instant claims. US'226 does not specify the detail on forming process. US'878 teaches steps of rolling and winding to form a coil spring (Fig.1-2 of US'878). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the rolling and winding processes as demonstrated in US'878 in the process of US'226 in order to deform the rod starting material to produce steel coil (claims 1-3 of US'878).

Still regarding claims 1, 25, and 26, US'226 in view of US'878 does not specify the limitation of skew rolling. However, skew rolling is a well-known rolling method which is evidenced by NPL-1 (as an Applicants administrated prior art—refer to the "Applicant arguments/remarks made in an amendment" filed on 1/8/2009; the Examiner notes that the Applicants provide the word explanation: phrase "skew rolling" is an English translation of German word "Schragwalzen" and in NPL-1, this phrase is translated as "cross rolling"). NPL-1 teaches skew rolling for the tubes and/or rods (English translation for Fig. 5-24 and 5-26 of NPL-1). Therefore, it would have been obvious

to one of ordinary skill in the art at the time the invention was made to apply the well-known skew-rolling method as evidenced by NPL-1 in the process of US'226 in view of US'878 in order to obtain desired roughness of the product (English translation for Fig. 5-24 of NPL-1).

Regarding claims 2-4 and 32-34, US'226 teaches inducting heating at a rate between 80-150K/s to a temperature between 900°C to 1200°C (Col.2, lines 48-52 of US'226), which reads on the inductively heating as recited in the instant claims 4 and 34; overlaps the range of 100-400K/s as recited in the instant claims 2 and 32; and overlaps the range of 700°C to 1100°C as recited in the instant claims 3 and 33.

Regarding claims 5 and 35, US'226 teaches austenitizing and holding the temperature for a short time, for example, less than one minute (Col.2, lines 63-67 of US'226), which overlaps the equalization heating time period range at least 10 seconds as recited in the instant claims.

Regarding claims 6, 7, 36 and 37, US'226 in view of 878 and NPL-1 teaches the same inductive heating the same steel with the similar temperature and holding time period as recited in the instant invention, the similar heating effect, for example, an uniform temperature over the length and keeping the temperature

constant prior to deforming would be highly expected in the process of US'226 in view of 878 and NPL-1. MPEP 2112.01.

Regarding the limitations of average degree of stretching for skew rolling (claims 9 and 30), maximum deformation area (claims 10 and 31), temperature and temperature dropping of skew rolling (claims 11, 15, 17, 37, 38, and 39), direction of the twisting (claims 12, 13, 27, and 28), and the dimension of skew rolling stand (claims 16 and 40), are recognized as result-effective variables in term of result of skew rolling technique. This position is supported by NPL-1. NPL-1 teaches the setting of skew rolling (Fig.5-24 to 5-26 of NPL-1) and the adjusting of the process parameters (English translation of NPL-1). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the result-effective variables for the skew rolling as demonstrated by NPL-1 in the process of US'226 in view of 878 in order to obtain the desired smooth surface (English translation of NPL-1).

Regarding claims 21, 24, 42, 43, and 44, US'878 teaches steps of rolling and winding to form a coil spring (Fig.1-2 of US'878). The spring alloy taught by US'226 in view of US'878 includes silicon-chromium steel (instant claim 43) and microalloyed steel (instant claim 44).

Allowable Subject Matter

Claim 14 is still objected to as depending from a rejected independent claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 7/28/2009 have been fully considered but they are not persuasive. Regarding the arguments related to the amended features, the Examiner's position is stated as above.

The Applicant argues that claimed technique--skew rolling coordinated with a particular pattern of heat treatment may obtain the desired twisting and maximum deformation with a desired deformation gradient and a desired crystal structure, which is not taught or suggested by the recorded prior arts. In response, The Examiner notes that the limitation of performing a gradient deformation to lead to structural distribution is only included in the instant dependent claim 14. US'226 in view of US'878 and NPL-1 teaches the process of thermomechanical treatment of steel for torsionally strained spring elements, for example skew rolling plus hardening and tempering as recited in the instant dependent claims 1, 25, and 26. The detail discussions and the motivation for combining the prior art can refer to the rejections for the instant claims stated above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jie Yang whose telephone number is 571-2701884. The examiner can normally be reached on IFP.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-2721244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JY
/Roy King/
Supervisory Patent Examiner, Art Unit 1793